

### REMARKS

Claims 1-29, 31, 32 and 36 were examined. Claims 1-29, 31, 32 and 36 were rejected. Claims 1, 12 and 21 are amended. Support for amended claims 1, 12 and 21 can be found in, for example, FIGS. 2C-2D. As such, no new matter has been added. Claims 1-29, 31-32 and 36 remain in the application.

#### Claims Rejected Under 35 U.S.C. § 103

A.

Claims 1, 3-7, 10-11, 31-32 and 36 were rejected under 35 U.S.C. §103(a) as being unpatentable over Applicants' Admitted Prior Art ("AAPA") in view of U.S. Pat. Pub. No. 2001/0055840 to Verret ("*Verret*").

Claims 2 and 9 were rejected under 35 U.S.C. §103(a) as being unpatentable over AAPA in view of *Verret* in further view of *Vogel*.

Claim 8 was rejected under 35 U.S.C. §103(a) as being unpatentable over AAPA in view of *Verret* in further view of U.S. Pat. No. 6,696,336 to DeBoer et al. ("*DeBoer*").

In order to establish a *prima facie* case of obviousness: (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference; (2) there must be a reasonable expectation of success; and (3) the references when combined must teach or suggest all of the claim limitations. MPEP 2142. Applicant respectfully submits that a *prima facie* case of obviousness has not been established.

More particularly, the cited references in combination do not teach or suggest all of the claim limitations. Amended independent claim 1 includes the limitation of "forming an attack barrier layer above the etch stop layer exposed by the second contact hole *wherein a lost portion of the etch stop layer is filled with a portion of the attack barrier layer.*" (claim 1) Thus, according to claim 1, a lost portion of the etch stop layer is filled with a portion of the attack barrier layer. (see, e.g., App. at p.20, lns. 1-2) In contrast, *Verret* describes a barrier layer 81 deposited on the exposed surfaces of the layer 76, the lead trenches 71-73, the via openings 66-

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68, and the exposed portions of surface 51. (p.4, ¶ [0033]) The barrier layer 81 is conformal with respect to the surfaces on which it rests, and therefore, does not fill in a lost portion of any underlying layers. (FIG. 10) As such, *Verret* does not teach or suggest all of the claim limitations of amended independent claim 1. AAPA does not cure *Verret*'s omission because it does not teach or suggest an attack barrier layer. (see, e.g., App. at FIGS. 1A-1D) Dependent claims 2-11, 31-32 and 36 depend on independent claim 1 and therefore include all of the limitations of independent claim 1.

Moreover, none of the cited references in combination provide the suggestion or motivation to modify the references. That is, modifying the references renders the references unsatisfactory for its intended purpose. MPEP § 2145(X)(D). Specifically, in *Verret*, if misalignment occurs when a contact hole is formed, the barrier layer 81 in *Verret* is deposited into a partial portion of the sidewall space layer of the gate pattern removed by misalignment of the contact hole. Therefore, the barrier layer 81 is connected to a gate electrode of the gate pattern, and a "short" between the barrier layer 81 and the gate electrode is expected to occur.

In view of the above remarks, Applicants respectfully submit that independent claim 1 and its dependent claims are patentably allowable over the cited references.

B.

Claims 12, 14, 15-16 and 19-20 were rejected under 35 U.S.C. §103(a) as being unpatentable over AAPA in view of *Verret* in further view of U.S. Pat. Pub. No. 2002/0074582 to Hiratani et al. ("*Hiratani*").

Claims 13 and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over AAPA in view of *Verret* in further view of *Vogel*.

The cited references in combination do not teach or suggest all of the claim limitations. Amended independent claim 12 includes the limitations of "forming a second plug electrically connected to the first plug through the second contact hole, wherein *a lost portion of the etch stop layer removed during the cleaning process is filled with a portion of the attack barrier layer.*" (claim 12) Thus, according to claim 12, a lost portion of the etch stop layer is filled with a portion of the attack barrier layer. (see, e.g., App. at p.20, lns. 1-2) In contrast, *Hiratani* describes

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a barrier layer 37 over at least a portion of a first plug 36. (FIG. 3) *Hiratani* does not teach or suggest that the barrier layer 37 fills in a lost portion of any underlying layers. Additionally, *Hiratani* does not teach an etch layer with a multi-layer structure. Accordingly, in view of the arguments presented with respect to amended independent claim 1, the references when combined do not teach or suggest all of the claim limitations of amended claim 12. Dependent claims 13-20 depend on independent claim 12 and therefore include all of the limitations of independent claim 12. Accordingly, Applicants respectfully submit that independent claim 12 and its dependent claims are patentably allowable over the cited references.

C.

Claims 21, 23-26, 28 and 29 were rejected under 35 U.S.C. §103(a) as being unpatentable over AAPA and *DeBoer*.

Claims 22 and 27 were rejected under 35 U.S.C. §103(a) as being unpatentable over AAPA and *DeBoer* in view of *Vogel*.

The cited references in combination do not teach or suggest all of the claim limitations. Amended independent claim 21 includes the limitation of "forming a second plug electrically connected to the first plug through the second contact hole, wherein *a lost portion of the etch stop layer removed during the cleaning process is filled with a portion of the attack barrier layer.*" (claim 21) Thus, according to claim 21, a lost portion of the etch stop layer is filled with a portion of the attack barrier layer. (see, e.g., App. at p.20, lns. 1-2) *DeBoer* describes a first blanket dielectric layer 80 and second blanket dielectric layer 82 formed on a structure. (col. 4, lns. 58-65) *DeBoer* does not teach or suggest that the layers 80 and 82 fill in a lost portion of any underlying layers. Additionally, although misalignment occurs when a contact hole is formed, the layers 80 and 82 cannot fill into a partial region of a sidewall space layer of the gate pattern removed by misalignment of the contact hole due to the oxide layer 22. Accordingly, in view of the arguments presented with respect to amended independent claims 1 and 12, the references when combined do not teach or suggest all of the claim limitations of amended claim 21. Dependent claims 22-29 depend on independent claim 21 and therefore include all of the limitations of independent claim 21. Accordingly, Applicants respectfully submit that

independent claim 21 and its dependent claims are patentably allowable over the cited references.

### CONCLUSION

In view of the foregoing, Applicant believes that all claims now pending, namely claims 1-29, 31-32 and 36 patentably define the subject invention over the prior art of record, and are in condition for allowance and such action is earnestly solicited at the earliest possible date. If the Examiner believes that a telephone conference would be useful in moving the application forward to allowance, the Examiner is encouraged to contact the undersigned at (310) 207-3800.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17, particularly, extension of time fees.

Respectfully submitted,

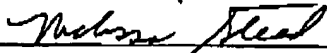
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Dated: 6/26/06

By   
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### CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this paper is being facsimile transmitted to the Patent and Trademark Office on the date shown below.

 6-26-06  
Melissa Stead Date